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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/573,480	07/26/2006	Samuel Neto	13111-00037-US1	2574
23416 7590 12/16/2009 CONNOLLY BOVE LODGE & HUTZ, LLP P O BOX 2207 WILMINGTON, DE 19899				
EXAMINER				
SAHA, BIJAY S				
ART UNIT		PAPER NUMBER		
1793				
MAIL DATE		DELIVERY MODE		
12/16/2009		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/573,480

**Applicant(s)**

NETO ET AL.

**Examiner**

BIJAY S. SAHA

**Art Unit**

1793

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 and 12-20 is/are pending in the application.
- 4a) Of the above claim(s) 11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 12-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB-08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

### **DETAILED ACTION**

The amendment filed on November 23, 2009 has been entered.

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants' submission filed on November 23, 2009 has been entered.

### ***Status of Application***

The amended and original claims 1-10 and 12-20 are pending and presented for the examination. The original claim 11 has been withdrawn.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-10 and 12-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mauldine et al USP 4,977,126 (US'126) in view of Ruedinger et al USP 6,274,763 (US'763).

Regarding claim 1, 2 and 3: US'126 teaches the following:

- A process for the preparation of surface impregnated dispersed cobalt metal catalyst (Title)
- Support material in the form of titania-alumina, silica and alumina (Col. 6 lines 25)
- Weight of support material in the range of 0.4 kg to 22.0 kg (Col 3 Table 2)
- A fluidizing gas air (Col 6 line 58)
- Fluidizing air rate in the range of 55 to 375 CFM (approximately 95 to 640 m<sup>3</sup>/h) (Table 2 Col 5)
- Temperature in the range of 40 to 110°C (Table 2 Col 7) maintained by the fluidized gas (Col 4 line 14)
- A feed solution that contains various chemical constituents for the catalyst (Col 3 lines 56-59)
- Support particles are sprayed with a suspension containing catalyst constituents (Col 3 line 43)
- Feed rate of the solution in the range of 19 – 294 grams/min (Table 2 Col 4).

US'126 does not explicitly teach the following:

- Composition of the binder in the suspension or solution containing the catalyst constituents,
- quantity of the binder in the suspension or solution containing the catalyst constituents.

US'763 teaches the following:

- Vinyl acetate and vinyl laurate (Col 5 line 17) as binder (Col 6 line 23)
- Loading of binder as 29 gram (3%) in Example 1 (Col 5 line 47) and 43.5 gm (6%) (Col 7 line 41)
- Other components of catalysts such as  $\text{TiO}_2$  and  $\text{V}_2\text{O}_5$  (Col 5 line 47)

At the time of invention it would have been obvious to a person of ordinary skill to synthesize the catalyst utilizing the process parameters (US'126 teaching) and adding binder in the solution (US'763 teaching). The suggestion or motivation for doing so would have been to add the "[c]atalytically active mixed oxide such as  $\text{V}_2\text{O}_5$ " (US'763) and prepare a "suspension" during "ball milling" and subsequent "drying" (US'763). In the absence of a binder, inorganic components do not adhere well to the support material.

With respect to Parameter K, taking the Table 2 Catalyst Preparation No. 1 through 14 data from US'126 and normalizing the numbers on the basis of support weight of 1 kg to 80 kg (as an example) can be normalized to meet the correct values of the air flow rate and solution rate. The values that be compared are temperature and binder concentration.

Hence, normalizing the US'126's support weight (from 0.4 kg to 22 kg) to applicant's support weight (from 60 kg to 240 kg), the range of flow gas and solution rate can be calculated analogous to the applicants' data.

Binder wt.% data as shown by US'763 is in the range of 3% to 6%.

Temperature is in the range of 40 °C to 110 °C.

Since the process parameters are in the range of applicants' data, it is expected that the K value will also follow.

Regarding the claim limitation of claim 1 "...for catalytic gas-phase oxidation of aromatic hydrocarbons...", examiner points out that the claim is drawn to "A process for producing a catalyst".

Regarding claims 4, 12 and 13, US'126 discloses air (Col 3 line 57).

Regarding claims 5, 6, 14, 15 and 16 US'763 discloses Two-coat catalyst (Col 5, Example 1) where 2<sup>nd</sup> spray suspension is sprayed on top of 1<sup>st</sup> spray suspension.

Regarding claims 7, 17, 18, 19 and 20, US'126 teaches application of supports in the form of spheres and extrudates in the size of 0.8 mm (Col 6 Table 1). US'126 does not explicitly teach catalyst in the shape of cylinders, rings or columns. Using the extrusion, desired size and shape can be obtained.

Regarding claim 8, US'126 discloses fluid bed equipped with nozzles entering either above or below to the bed; such devices being available from commercially available sources and suppliers (Col 4 lines 45-55).

Regarding claim 9, US'763 discloses application of  $\text{TiO}_2$  and  $\text{V}_2\text{O}_5$  (Col 5 line 47) in the range of 1-4 wt. %; US'763 also teaches ball milling process (Col 5 line 48). US'763 does not expressly teach a specific particle size range. It is commonly known in the art that ball milling process (taught by that US'763) is capable of producing the particle size in the range of 20 micron to 250 microns.

Regarding claim 10, US'763 discloses application of  $\text{V}_2\text{O}_5$  (Col 5 line 47).

### ***Summary***

The claims 1-10 and 12-20 are rejected.

### ***Response to Arguments***

Applicant's arguments filed November 23, 2009 have been fully considered but they are not persuasive.



Applicants argue about the use of the catalyst in the gas phase oxidation of aromatic hydrocarbons. Examiner considers that a catalyst can be used in any chemical reaction unless there is something very specific about the chemical composition of the catalyst that prohibits the application in an alternative gas phase reaction. Applicants' claim is drawn to a process for producing a catalyst, not to a particular composition of the catalyst for a specific use.

Applicants argue about the range of "K" value.

Examiner points out the following:

Parameter	Unit	Claim Range	Prior Art
$Q_{\text{gas}}$	m <sup>3</sup> /hour	3000-9000	95-640
$Q_{\text{susp}}$	gm/min	1000-3500	19-294
$B_{\text{susp}}$	%	2-18	3, 6
<b><math>M_{\text{support}}</math></b>	<b>Kg</b>	<b>60-240</b>	<b>0.4-22</b>
$T_{\text{gas}}$	°C	75-120	40-110
Constant	7	—	—

All the process variables have been disclosed by the prior art. A chemical process can run on a few kilograms of material as well as hundreds or thousands of kilograms of material with appropriate scale up factors.

Further, claimed range is the scale up of the prior art; for example, if the mass is increased from prior art of 0.4-22 kg to the claimed range of 60-240 kg, all other parameters such as  $Q_{\text{gas}}$  and  $Q_{\text{susp}}$  would be normalized to meet the mass value of the reaction. The absolute parameters such as the  $B_{\text{susp}}$  and  $T_{\text{gas}}$  are within the window of the claimed range. Since the process parameters are in the range of applicants' data, it is expected that the K value will also follow. Applicants provide the "K" value as 218

and argue it to be outside the range. Examiner points out that the number is for a specific value 1 kg; the range of values is 0.4 kg to 22.0 kg. In the algorithm for "K",  $Q_{\text{susp}}$  and  $M_{\text{support}}$  values are subtractive ( $-0.055 Q_{\text{susp}}$  and  $-0.667 M_{\text{support}}$ ). Simply by taking the median values of the prior art, the "K" value comes out to be 133.53 which is within the range of 127.5 to 202. If the applicants select another range of  $M_{\text{support}}$  the normalized values of  $Q_{\text{gas}}$  and  $Q_{\text{susp}}$  would be proportionality change; however, "K" values would still remain within the range. It is a matter of scale up and normalization.

Applicants argue that US'126e (US'126) fails to suggest using particles such as  $V_2O_5$ . As stated in the claim rejection, (US'763) suggests the application of  $V_2O_5$  and the binder with the motivation to use both.

Applicants argue about "insufficient drying". Examiner points out that the temperature is in the range of 40C to 110C (claim range is 75 to 120C). Drying depends upon the total mass, obtained by normalizing the prior art as indicated above for a given length of time. "K" value does not have time as a parameter.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BIJAY S. SAHA whose telephone number is (571) 270-

5781. The examiner can normally be reached on Monday- Friday 8:00 a.m. EST - 5:00 p.m. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Mayes can be reached on (571) 272 1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BIJAY S SAHA/  
Examiner, Art Unit 1793

BSS

December 14, 2009

/Melvin Curtis Mayes/  
Supervisory Patent Examiner, Art Unit 1793